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A Report of the Economic Team of the ICCAP

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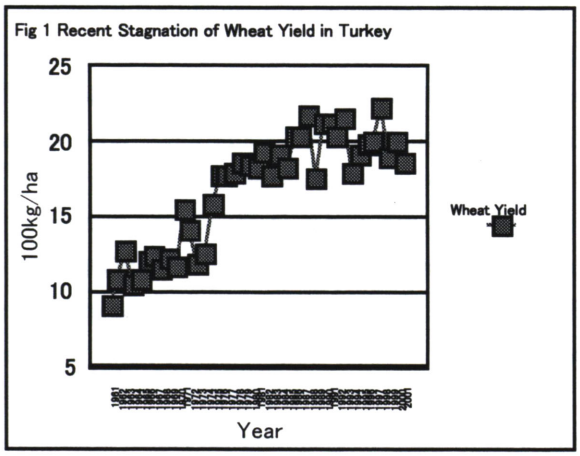
1.The yield of wheat, that is the major staple cereal in turkey, has been stagnant during last two and half decades. We hypothesize that this stagnation is caused by soil degradation, decrease in water resources, climatic factors, and economic factors such as wheat price decline and very severe inflation. We would like to test these hypotheses by the analysis for our farm survey data, agloclimatological analysis, and agricultural policy analysis.



1.1The Four Components of the ICCAP's Economic and Institutional Study

(1) Study of farmers' economy, and farmers' perception and responses to climatic changes, technological changes, natural resource changes, and policy and institutional changes. Tsujii, Erkan, Asami, graduate students.

(2) A regional economic and econometric study of the interactions among climatic changes, agricultural market and policy. Kagatsume, Tsujii, Ufuk, and Yatagai.

(3) A regional agricultural sector model analysis of the relation among products' structure, water use, agricultural policy, and climatic changes. Kameyama and Tsujii.

(4) Institutional economics analyses of the use of natural resources and commons such as water and soil by farmers, pastoralists, and the government. Umetsu, Asami and Tsujii.

2. Farmers' Perception and Response Study: Tsujii, Erkan, Asami, and the Japanese and Turkish graduate students.

2.1 Our Farm Surveys

Two farm surveys were conducted In Konya and Seyhan Basin of Adana in 2002/3 and 2003. About 50 farms were selected by stratified non-random method from each survey village in irrigated (IR) and rain-fed (RF) areas, and they were interviewed using a questionnaire that was used in Nigeria, Tanzania, Indonesia, and Japan by Tsujii.

Three master theses have just been completed analyzing the farm data collected.

2.2 Three master theses

A. Impacts of credit rationing by Kusadokoro

A major part of farmers' credit provided by a government agricultural credit institution (ACC henceforth). The agricultural credit was determined by the value of each farmer's owned land, and this is credit rationing. Kusadokoro found from his analysis of the farm survey data that credit rationing made farmers with smaller owned land worse off. ACC gave its credit in kind, such as fertilizer, and Kusadokoro found that agricultural productivity of the farmers who face credit rationing was lower, because of the fact that ACC's credit was given in kind. Consequently, credit rationing in rural Turley worsened farm income distribution and decreased agricultural productivity, ceteris paribus.

B. Animal manure market by Maru

Based on the analysis of the farm survey data and village survey in 2002 and 2003, Maru found, first,

that animal manure was input much less than what surveyed farmers thought appropriate. This deteriorated soil profile structure that decreased inherent soil fertility. Maru also found that mechanization and a government policy change have decreased number of livestock in the surveyed villages. This decreased the supply of animal manure especially in rain fed area. In irrigated area, commercial crops and orchards have expanded their areas and animal manure demand in creased. These were the reasons why inter-regional animal manure market developed. Manure traders emerged and started to market manure from the rain-bed area to the irrigated area in Turley.

C. Emancipation of female labor by Gulnur

Based on the analysis of female family labor distribution using the date collected using the formal farm survey questionnaire and a female family labor distribution questionnaire, asked to house wives of the surveyed farms, she found that farm family females were relieved or emancipated more from simple hard agricultural labor work by the substitution of such female work with hired labor, as the income of farm households became greater when more intensive and commercial agriculture was usually adopted by them as shown in Table 1.

Table 1. Relationship among Per Capita Household Income, Hired Labor Input, and Wives' Agricultural Labor Input.

Data	Kilicli (RF)	Beloren (RF)	Kayisli (IR)	Abdioglu (IR)
Income/capita (million TL)	957	1,084	1,547	2,111
Hired labor input days/HH	288.9	160.4	217.6	2341.8
Agricultural labor input days/wife	182.2	183.8	38.6	18.8

Source: Farm household survey in October-November 2003

She explains this fact by the theory of backward bending labor supply model.

2.3. Agricultural Sustainability and Farmers' Perception and Responses

A quantitative analysis of the relationships among farmers' perceptions of changes in climate and in natural resources, and their impacts to farmers' responses in cropping pattern, water use, chemical fertilizer and manure use, and fallowing, using our farm survey data was started in Japan and Turkey. Six papers on the similar topic using the similar methodology and farm survey questionnaire were already published or accepted for Nigeria and Indonesia by Tsujii with Dr. Chianu and Mr. Ageng.

2.4 A Farm Survey Report

We plan to publish a report of our farm surveys in Turkey as a major part of our report of economic subgroup of ICCAP in April 2004.

3. A regional economic and econometric study of the interactions among climatic changes, agricultural market and policy. Kagatsume, Tsujii, Ufuk, and Yatagai.

3.1 The Input-Output Model by Kagatsume

In Figure 1, each sector is distributed into the 4 regions in the coordinate space, which are classified by the intersection of lines of unit coefficients.

So-called "the skyline analysis" can be carried out. The results are shown in Figure 3. According to these results, it is shown that the fruits, livestock products, farm processed commodities and bread are self-sufficient but cereals, vegetables, forest products, fisheries, meat processing sector are in deficit situation. Also most of manufacturing and service sectors are in deficit situation.

By applying these results for at least two time period and regressing the inout coefficients on the climate change in each districts of Turkey, it can be forecasted how these climate changes affects the agricultural productivities.

3.2Agricultural Economic and Agro-climatological Study of the Relation among Wheat Production and Climatic Changes and Its Effects to the Sustainability of Turkish Agriculture (Tsujii, Ufuk,

and Yatagai).

A time series agro-climatological and economic analysis among wheat yield and area sown, monthly weather data, and economic and agronomic variables for Adana, Konya, and Turkey was started when Mr. Ufuk came to Japan in 2003. Some quantitative results about heat and cold damages, and positive effects of rainfall in some months were obtained, but more research should be done in 2004. There were several past studies on the similar topics by Tsujii for Thai and Japanese Rice.

3. A regional agricultural sector model analysis of the relation among products' structure, water use, agricultural policy, and climatic changes. Kameyama and Tsujii.

Kameyama made no progress so far for formulating and estimating the regional agricultural sector model for Adana region for our ICCAP economic project.

4. Institutional economics analyses of the use of natural resources and commons such as water and soil by farmers, pastoralists, and the government. Umetsu, Asami and Tsujii.

Umetsu conducted a study of the transfer of water authority to and the role of WUAs in Lower Seyhan River Basin. . By 2002, transfer of management reached roughly 2 million ha. The impacts of transferring authority to WUAs can be largely in I) reduction of O&M costs, ii) reduction of water fee, iii) increased fee collection rate, IV) equitable distribution of water among head and tail farmers.

Asami conducted a study of deterioration of government pasture by unlawful intrusion by farmers. Huge area of government pasture has been destroyed since a few decades ago mainly by the unlawful intrusion for the use as private cropland. It has been very difficult for the government to watch and monitor each unjust farmer who intruded into the government pasture. Only 70% of whole land in Turkey has been registered with title deeds, i.e. 'tapu.' In order to meet the demand of animal products and conserve government pasture, 'law of pasture' (law no. 4342) was enacted on February in 1998. But the purposes of the law were very difficult to attain, and government by now has taken only 10% of unlawfully intruded area of government pasture.

Table1: The logit estimation of determinants of credit constraints

	Estimated coeffifients	t-Statistic	dp/dx	
			1	0
TAPLAND	-0.0175	-2.3417 **	-0.0018	0.0018
MNGGRP	0.5361	1.8670 *	0.0542	-0.0542
NOMADLT	-0.0835	-0.2765	-0.0084	0.0084
AGE_H	-0.0017	-0.0536	-0.0002	0.0002
EDUC_H	-0.2385	-0.6852	-0.0241	0.0241
VLDSIZE	-0.0015	-0.8458	-0.0002	0.0002
OFFINC	-0.2024	-2.1602 **	-0.0205	0.0205
TLIVVLU	-0.0227	-0.3234	-0.0023	0.0023
TRCTRN	0.5068	1.1676	0.0512	-0.0512
OWNIRCD	-0.5736	-0.8289	-0.0412	0.0412
VLDM01	-2.2868	-2.7800 ***	-0.1291	0.1291
VLDM02	-0.5396	-0.6826	-0.0421	0.0421
VLDM03	-1.4328	-1.8245	-0.1266	0.1266
C	1.4958	0.8636		
Log of likelihood			-49.3991	
Number of observations			97	
Percentage correct predictions			81.4	

*Significant at 10% level, **Significant at 5% level, ***Significant at 1% level
dp/dx are marginal effects evluated by mean values

Table2: The tobit estimation of determinants of borrowing money

	ACC Members		Not ACC Members	
	Estimated coeffifients	t-Statistic	Estimated coeffifients	t-Statistic
TAPLAND	6.84E+07	2.06807 **	-3.93E+07	-1.46535
MNGGRP	9.71E+08	0.497623	2.78E+09	2.4025 **
OFFINC	4.79E+08	0.862052	1.31E+08	0.461785
VLDM01	2.14E+09	0.508454	2.43E+09	0.745799
VLDM02	1.74E+10	4.02419 ***	1.74E+09	0.54221
VLDM03	-1.17E+09	-0.305091	-1.65E+09	-0.382373
C	-9.42E+09	-1.72459	-1.10E+10	-2.53493 **
Number of observations	36		53	
Number of positive observations	25		12	
Log of likelihood	-611.42		-299.782	

**Significant at 5% level, ***Significant at 1 % level

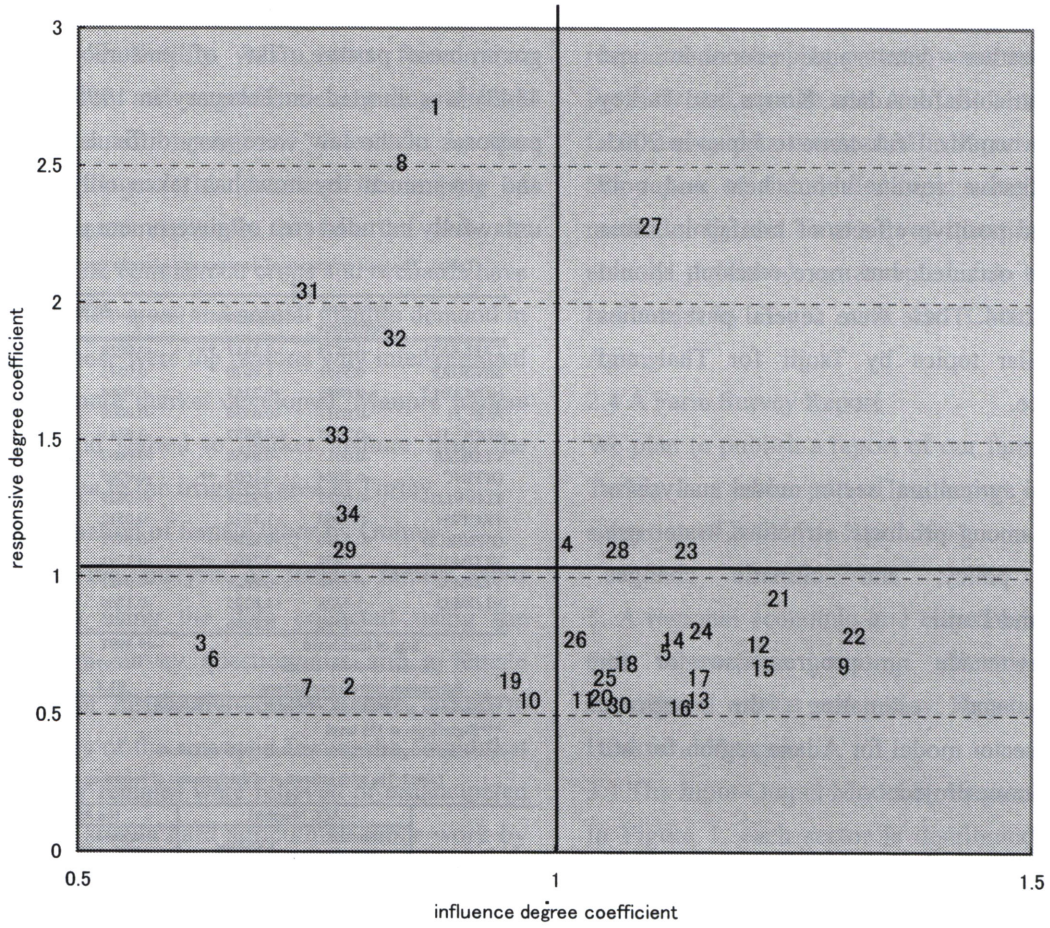
Table. The logit estimation of livestock manure input

Log of likelihood: -79.696
Number of observations: 156

	Estimated Coefficients	Standard Error	t-Statistic	p-Value
TLMRNDCD	1.021	0.518	1.971 **	0.049
BBHB	0.027	0.008	3.446 ***	0.001
ENBLLBTL	0.598	0.309	1.935 *	0.053
TRCTRN_F	1.148	0.464	2.474 **	0.013
FTPRSZ_M	-0.035	0.023	-1.504	0.127
IRCODE	0.803	0.533	1.507	0.132
CITYID	1.300	0.522	2.490 **	0.013
Constant	-2.910	0.669	-4.350 ***	0.000

*Significant at 10% level, **Significant at 5% level, ***Significant at 1% level

Figure1: Influence & Responsive Degree Coefficients



1.cerial	2.vegetable	3.fruits	4.livestock	5.farm process	6.forestry	7.fishery
8.coal/oil	9.meat process	10.fish process	11.fruit/vegetable process	12.fat	13.dairy prod	14.flour
15.feed	16.bread	17.sugar	18.cake	19.alcohl	20.tabaco	21.textile
22.leather	23.wood/paper	24.fertilizer	25.drugs	26.medicine	27.nonmetal materials	28.machine
29.utilities	30.construction	31.retail	32.transport	33.finance	34.administration	